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No. XVIII.

TRANSLATION.

A Memoir on Animal Cotton, or the Insect Fly-Carrier.
By M. BAUDRY DES LOZIERES, *Member of several Academies, and Founder of the Society of Sciences and Arts, at Cape François.*

GENTLEMEN,

BEFORE I enter upon the subject of this memoir, I ought to pay the tribute of praise which is due to your useful labours. But the style of eulogy is ill suited to the plainness of an American farmer, and while you are constantly employed in *deserving* praise, you cannot spare time to *hear* it.

I am now going to communicate to you, with some observations upon it, a fact of entomology which I have myself witnessed during my residence at St. Domingo, and which, if I am not mistaken, deserves your greatest attention, because it may introduce a new branch of commerce with the West India colonies, and render very useful an animal which has hitherto been known only by the mischief which it occasions.

Every inhabitant of the West Indies knows and dreads the greedy worm which devours their indigo and cassada plantations. But people have hitherto turned their attention more to the means of destroying it than of rendering it useful. It is indeed very natural to endeavour to destroy our enemy, but to compel him to be of service to us is by far the greater triumph.

Its

Its Birth, Growth, and Death.

The cassada worm is produced like the silk worm, that is to say, from the eggs which the mother scatters every where, after she has undergone her metamorphosis into a whitish butterfly, or of a light pearl colour.

The egg is hatched about the latter end of July. Its developement is quick, for in September the worm is changed into a butterfly.

This month of September is the season of his loves. The constant motion of his wings shews the ardency of his passion which he indulges day and night and even while feeding. The excess of this indulgence soon destroys him, he dies in the same month after violent convulsions.

I have said that his life begins at the end of July. He is decked at his birth with a robe of the most brilliant variegated colours. This elegant livery, which nature seems to have delighted in forming, renders him always agreeable to the eye, which always dwells upon it with pleasure.

Its Affinities.

It has appeared to me to be a smooth caterpillar whose external shape is exactly like that of the silk worm.

It differs however from it, by its size, by its thickness, and by the beauty of its colours.

It again differs from the silk worm, because it does not itself work the cone which I am going to speak of.

I leave it to the learned to delineate its external configuration, and to determine upon the family of insects to which it belongs. I shall only say that I do not believe it has, like the silk-worm, an intestine going in a direct

line from the mouth to the anus, because it appears to me that this cause of elaboration would not have the same destination.

Its Food.

It feeds on cassada leaves, of which it is extremely greedy. It feeds at all hours, day and night. It also nibbles the leaves of the potatoe, this is however but a transitory taste, it soon returns to the cassada leaf.

I have to observe that after it has taken its food, when the time of its metamorphosis arrives, it does not purge itself by diet, like the silk worm, but continues to eat to the last moment.

The Approach of its Metamorphosis.

In the month of August, and when on the point of undergoing its metamorphosis, it strips off its superb robe, and puts on one of an admirable sea-green, this fundamental colour reflects all its various shades, according to the different undulations of the animal, and the different accidents of light.

The Sting of the Ichneumon Fly.

This new decoration is the signal of its tortures. Immediately a swarm of ichneumon flies assail it. I think I am not mistaken when I assert that there is not one of its pores that has not one of those flies fastened to it. There is even no necessity of making use of the microscope to see that he is covered with them.

In vain he struggles with all his might, raises himself upright to get rid of his cruel tormentors—He must submit. Those flies, of the smallest species, and which can only be studied by means of the microscope, drive their
stings

flings into the skin of their victim, over the whole extent of his back and sides. Afterwards, and all at the same time, they slip their eggs into the bottom of the wounds which they have made.

After having performed this dreadful operation, the ichneumon flies disappear, and the patient remains for an hour, in a drowzy and even motionless state, out of which he awakens to feed with his former voracity. Then he appears much larger, and his size increases every day. His green colour assumes a deeper hue, and the tints produced by the reflection of the light are more strongly marked. The animal in this state of factitious pregnancy, if I may so express myself, is worthy of all the attention of the observer of nature.

I shall not undertake the description of the ichneumon fly, it is well described in the books. If I have observed a difference, it is the same which exists between the European *gnat* and the *musquitoe* of hot regions, that is to say, that our West-India flies are of a lesser size.

I have now to describe the operation which the ichneumon flies, which are extremely small, perform at the very moment of their coming into the world; you will judge, gentlemen, whether this expression is accurate.

Animal Cotton.

A fortnight after the ichneumon flies have thus cruelly deposited their eggs by perforating the unfortunate cassida-worm, that is to say, some time in the month of August, those eggs may be seen by the help of a microscope, hatching on the body of that animal.

Those eggs are all hatched at the same moment, and it is impossible to catch the moral point of time which may intervene between the birth of one and that of another.

ther. At one glance, the cassada-worm is seen covered with all the little worms that have just been hatched. They issue out of him at every pore, and that *animated robe* covers him so entirely, that nothing can be perceived but the top of his head. He then turns to a dirty white, the little worms appear black to the eye, but their true colour is a deep brown.

This operation lasts hardly more than an hour, and is followed by another which is not much larger but which is much more curious.

As soon as the worms are hatched, and without quitting the spot where the egg is which they have broke through, they yield a liquid gum, which by coming into contact with the air, becomes solid and slimy.

At the same time, and by a simultaneous motion, they raise themselves on their lower extremity, shake their heads and one half of their bodies, and swing themselves in every direction. Now is going to begin an operation which will afford the greatest delight to the admirer of nature.

Each of those *animalculæ* works himself a small and almost imperceptible cocoon in the shape of an egg, in which he wraps himself up. Thus, they make, as it were, their winding sheet. They seem to be born but to die.

Those millions and millions of cocoons, all close to each other, and the formation of which has not taken two hours, form a white robe in which the cassada-worm appears elegantly clothed. While they are thus decking him, he remains in a state of almost lethargic torpidity.

As soon as this covering is woven, and the little workmen who have made it have retired and hid themselves in their cells, the worm endeavours to rid himself of those barbarous guests, and of the robe which contains them,

them, but he does not succeed in this attempt without the greatest efforts.

He comes out of this kind of enclosure, entirely flaccid and dull, instead of his former fat and shining appearance, his skin now appears flabby, wrinkled and dirty, and gives him the appearance of decrepitude. He is now an exhausted, suffering being, threatened with approaching death.

He will still gnaw a few leaves, but he no longer eats with that voracious appetite, which indicated an active and vigorous constitution. Shortly afterwards he passes to the state of a chrysalis, and after giving life to thousands of eggs, he suddenly loses his own, leaving to the cultivator who has not yet bethought himself of calculating the advantage that he may draw from him, an advantage which may be so improved as to much more than compensate the ravages which he occasions.

Shell of the Ichneumon Fly.

I had imagined that the thousands of little worms which this shell contains in the cocoons of which it is composed, would be hatched some day. I shut it up therefore in a box closed with great caution. Every morning, and very often in the course of the day, I examined it, in order to catch the moment when those little animals were to be born a second time.

In fact, at the expiration of about eight days, I found the inside of the box lined with a cloud of little flies. I made myself certain that they issued out of the little cocoon. Several which issued out of them before my eyes, left me no doubt as to the fact.

I then took up some of those flies, and putting them on a pincer, I examined them with a microscope.

They

They are bold and lively: they have four wings. Their antennæ are long and vibrating, their belly hangs by a very fine thread: there are some that have a tail, and others that do not shew it. Afterwards I satisfied myself that they feed upon small insects that appear to be of the family of *Acarus*. Those indications appeared to me sufficient to be satisfied that they belong to the family of the ichneumon.

Observations on Animal Cotton.

I have often held in my hand that cotton shell or wrapper. Its whiteness is dazzling. As soon as the flies have quitted the cocoon, it may be used without any preparatory precaution. It is made up of the purest and finest cotton.

I call it *cotton* because it is *idio-electric* and is pervious to the electric fluid.

I add to this denomination the epithet *animal*, in contradistinction to common cotton, which may henceforth be called *vegetable cotton*, so that the two species may be distinguished from each other by their names, as they are by their origin, although they are very nearly related to each other in their effects.

It is to be observed, that what might be called *cob-web* in the covering of the fly-carrier, or small flocks of silk which are probably intended to shelter the animal from the rain, is far superior to what is called *ferrit* before, and *flect silk* after the preparation of the finer silk. There is no refuse, no inferior quality in animal-cotton. Every thing in it is as fine and beautiful as can be imagined.

It is possible, if we may form a judgment by analogy, that medicine, which has extracted from silk what is called *English drops*, a remedy to which the greatest efficacy
is

is attributed, may derive a similar advantage, perhaps for the cure of other disorders, from an extract of the animal cotton, which might be called the *St. Domingo drops*.

In short there is no need here of any of the precautions which the silk-worm requires. The robe which covers the fly-carrier, is worked every where, and every where perfectly well.

I shall only observe that as the rain speedily destroys the cassida-worm, the instant might be seized on when the ichneumon fly has deposited her eggs, to put the fly-carrier under shelter. His natural food might be procured for him, as is done with the silk-worm.

The ichneumon fly never fails thus to come and deposit her eggs. I have never seen a fly-carrier that was not covered with the robe or shell that I have spoken of. I have continued this observation for many years, and the crop was so abundant, that I alone, could collect in less than two hours, the quantity of one hundred pints, French measure.

I repeat it, animal cotton is attended with none of the difficulties which occur in the preparation of vegetable cotton. It is so pure, that as soon as the ichneumons have left it, which happens 8 or 10 days after their reclusion, it may be carded and spun.

If it should want any preparation, it could be only in case it should not have been sufficiently guarded against dust and rain.

Vegetable cotton, besides the seeds that produce it and with which it is charged, is filled with extraneous matter, of which it cannot be freed, but with a minute attention, many hands and much time, or with the help of machines which have not yet been brought to perfection.

In every point of view, animal cotton appears to me to have a great superiority over that of the vegetable kind.

It will, perhaps, be wondered at, that experience has not long ago ascertained this fact, but let it be considered that the silk-worm and its use, were known long before any use was made of them, and that we are now carefully repairing the losses that we have suffered by the careless indifference of our fore-fathers.

The fly-carrier may experience the same fate, because it is less difficult to reason than to make experiments, but I dare hope that as soon as it shall have prevailed over the sophistry of indolence, it will stand the competition with silk and vegetable cotton. It is more abundant than either. It requires less time and less trouble to procure it.

I have but one word more to add. Silk and vegetable cotton serve only to envenom and inflame wounds, which is attributed to the asperities of their filaments; I have frequently employed animal cotton as lint in the hospital of my plantation, it has always supplied the want of that made of flaxen linen, and I have not observed the smallest inconvenience to arise from the use that I have made of it.

Had it not been for the troubles that have laid our colony waste, and which have prevented the necessary communication, I should have brought to you a fly-carrier in every one of the periods of his life. You would have seen the eggs, the magnificent robe with which he is decked at his birth, the kind of food that he is fond of, the simple but noble vestment in which he wraps himself up on the approach of his tormentors, you would have seen those covering his whole body as it were with points, you would have seen him covered with his shell, and that same shell carded, spun and ready for the weaver. I had in a great degree already executed this design.

But it is too well known that I have not been able to save any thing in my flight from home, you will, however, be able at a future day to ascertain the truth of the
fact

fact that I have stated to you. I thought that a fact of this nature deserved to be deposited among your archives, and I may perhaps request of you the permission of depositing there some other still more curious facts.

BY DES LOZIERES.

Philadelphia, 3d Feb. 1797.

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